

AMENDMENTS TO THE CLAIMS:

Please cancel Claims 1–13 without prejudice or disclaimer of the subject matter contained therein. Please amend Claims 14–18, 20, 23, 24, and 27–31 and add new Claims 32–40 as shown below. This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1–13. (Cancelled)

14. (Currently amended) A spectrometer comprising:

a plurality of sub-aperture telescopes forming an extended aperture telescope, wherein each sub-aperture telescope includes an adjustable-optical path and is configured to collect a select portion of a wavefront, and wherein a center-to-center spacing between adjacent sub-aperture telescopes of the plurality of sub-aperture telescopes is not greater than $2d$, where d is a diameter of one of the adjacent sub-aperture telescopes;

combiner optics configured to interfere the select portions of the wavefront at an image plane of the plurality of sub-aperture telescopes to form interference patterns at the image plane; and

a Fourier transformation module configured to derive spectral information from the interference patterns.

15. (Currently amended) The spectrometer of claim 14, wherein, to derive the spectral information, the Fourier transform transformation module is configured to Fourier transform the interference patterns with one or more of the adjustable-optical paths set at a variety of path lengths.

16. (Currently amended) The spectrometer system of claim 15, wherein the variety of path lengths ~~represent~~ represents a relative path-length difference between one or more of the adjustable-optical paths.

17. (Currently amended) The spectrometer of claim 14, wherein the Fourier transformation module includes an image-capture array disposed at the image plane and configured to capture images of the interference pattern patterns.

18. (Currently amended) The spectrometer of claim 17, wherein the Fourier transformation module is configured to Fourier transform intensity profiles generated by one or more pixel pixels included in the image-capture array.

19. (Original) The spectrometer of claim 17, wherein the image-capture array includes a charge-coupled device (CCD) array or a complimentary metal oxide (CMOS) array.

20. (Currently amended) A spectrometer comprising:

a Fizeau interferometer having a plurality of optical collectors, wherein one or more of the optical collectors includes an adjustable-optical path, and wherein each optical collector is configured to collect a select portion of a wavefront, and wherein a center-to-center spacing between adjacent optical collectors of the plurality of optical collectors is not greater than $2d$, where d is a diameter of one of the adjacent optical collectors; and

a Fourier transformation module configured to derive spectral information of the wavefront from interference patterns of the select portions of the wavefront.

21. (Original) The spectrometer of claim 20, wherein the Fizeau interferometer forms an extended aperture telescope.

22. (Original) The spectrometer of claim 20, wherein the spectrometer is configured to be deployed in space.

23. (Currently amended) The spectrometer of claim 20, wherein, to derive the spectral information, the Fourier ~~transform~~ transformation module is configured to Fourier transform the interference patterns of the wavefront with one or more of the adjustable-optical paths set at a variety of path lengths.

24. (Currently amended) A method for deriving [[a]] spectral information from a wavefront, the method comprising:

collecting a plurality of select portions of a wavefront with a corresponding plurality of ~~multi-aperture sub-aperture telescopes which form a multi-aperture telescope, wherein a center-to-center spacing between adjacent sub-aperture telescopes of the plurality of sub-aperture telescopes is not greater than $2d$, where d is a diameter of one of the adjacent sub-aperture telescopes;~~

interfering the select portions of the wavefront at an image plane of the multi-aperture telescope to form interference patterns at the image plane; and

Fourier transforming the interference patterns to derive spectral information for the wavefront.

25. (Original) The method of claim 24 further comprising generating a spectrogram from the spectral information.

26. (Original) The method of claim 24, wherein interfering the select portions of the wavefront includes interfering the select portions of the wavefront with a combiner telescope.

27. (Currently amended) The method of claim 24 further comprising collecting images of the interference ~~pattern~~ patterns with an imaging array.

28. (Currently amended) The method of claim 27, wherein Fourier transforming the interference patterns includes Fourier transforming ~~interference patterns~~ images of the interference patterns collected by the imaging array.

29. (Currently amended) The method of claim 24 ~~27~~ further comprising locating the imaging array at an image plane of the multi-aperture telescope.

30. (Currently amended) The method of claim 24 further comprising:
pistoning adjustable-optical paths of the sub-aperture telescopes at ~~a~~ plurality of positions; wherein each of the interference patterns corresponds to a select piston position of the adjustable-optical paths.

31. (Currently amended) The method of claim 30 further comprising:
Fourier transforming one or more intensity profiles generated by [[a]] one or more pixels, respectively, of an image-capture array.

32. (New) A spectrometer comprising:
a plurality of sub-aperture telescopes, each sub-aperture telescope being configured to collect a select portion of a wavefront, a center-to-center spacing between adjacent sub-aperture telescopes of the plurality of sub-aperture telescopes not being greater than $2d$, where d is a diameter of one of the adjacent sub-aperture telescopes, at least one of the plurality of sub-aperture telescopes including an adjustable-optical path;
combiner optics configured to interfere the select portions of the wavefront at an image plane of the plurality of sub-aperture telescopes to form interference patterns at the image

plane; and

a Fourier transformation module configured to derive spectral information from the interference patterns.

33. (New) The spectrometer of claim 32, wherein the Fourier transformation module is configured to Fourier transform the interference patterns to derive the spectral information.

34. (New) The spectrometer of claim 32, wherein, to derive the spectral information, the Fourier transformation module is configured to Fourier transform the interference patterns of the wavefront with the adjustable-optical path set at a variety of path lengths.

35. (New) The spectrometer of claim 32, wherein the Fourier transformation module is configured to generate a spectrogram of the wavefront.

36. (New) The spectrometer of claim 32, wherein the Fourier transformation module includes an image-capture array disposed at the image plane configured to capture images of the interference pattern.

37. (New) The spectrometer of claim 36, wherein the image-capture array includes a charge-coupled device (CCD) array or a complimentary metal oxide (CMOS) array.

38. (New) The spectrometer of claim 32, wherein the Fourier transformation module includes software code configured to perform the Fourier transformation.

39. (New) The spectrometer of claim 32, wherein the Fourier transformation module includes electronic hardware configured to perform the Fourier transformation.

40. (New) The spectrometer of claim 32, wherein the spectrometer is configured to be deployed in space.